Původní sdělení | Original research article

Knowledge Upgrading of General Practitioners in the Community Health Cares in Surabaya after Joining Virtual Training of Early Cardiovascular Detection in Pregnancy: A Quasi-Experimental Study

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ARTICLE INFO

Article history:
Submitted: 7. 9. 2022
Accepted: 8. 1. 2023
Available online: 17. 8. 2023

Klíčová slova:
Prevence srdečních onemocnění
Těhotenství
Znalosti

SOUHRN

Cíl: Posoudit rozšíření znalostí praktických lékařů působících v komunitních zdravotnických zařízeních v indonéském městě Surabaya po intervenci formou virtuálního vzdělávání se zaměřením na screening, rozpoznávání a léčbu kardiovaskulárních onemocnění v těhotenství.
Metoda: Tato studie je kvasiexperimentální s uspořádáním jedna skupina před testem a po testu. Všichni účastníci studie absolvovali intervenci v podobě edukačního programu o diagnostice srdečních onemocnění v těhotenství. Účastníky byli praktičtí lékaři působící v komunitních zdravotnických zařízeních ve městě Surabaya. Test před intervencí a po ní sestával z otázek a odpovědí na probíraná témata. Po intervenci byla porovnána průměrná skóre testů.
Výsledek: Byl nalezen statisticky významný rozdíl (ANOVA; $p < 0{,}001$) v hodnotách skóre před intervencí mezi skupinami *s* pracovními zkušenostmi v délce tří let (22,04), tři až pět let (32,44) a více než pět let (40,44); nebyly však zjištěny žádné rozdíly ve smyslu zvyšování skóre v testu po intervenci. Hodnoty skóre před testem dosažené účastníky *v* sektoru komunitních zdravotnických zařízení byly statisticky významně vyšší (36,53 ± 9,18) než tyto hodnoty účastníků mimo uvedený sektor (32,33 ± 9,65) ($p < 0{,}05$); nicméně míra zvýšení skóre po testu se mezi skupinami statisticky významně nelišila ($p = 0{,}875$).
Bylo zaznamenáno statisticky významné zvýšení hodnot skóre testu ($p < 0{,}001$) od testu před intervencí a po ní; zvýšení dosáhlo průměrně 42,18 bodu a neovlivnily je žádné jiné proměnné.

Keywords:
Heart disease prevention
Knowledge
Pregnancy

ABSTRACT

Aim: To assess the knowledge improvement of general practitioners of Surabaya community health centers about screening, recognizing, and managing cardiovascular disease in pregnancy after receiving intervention, formed as virtual training.
Method: This study is a quasi-experimental study with one-group pretest-posttest design. Intervention, formed as educational training about heart disease detection in pregnancy, was given to the participants. Participants consisted of general practitioners practicing at Community Health Centers in Surabaya. Pre-test and post-test consisted of questions about training's curriculum was given to the participants. Mean scores of the tests compared after the intervention.
Results: There was a statistically significant difference (ANOVA *p*-value <0.001) in the pretest scores between groups with working experience of 3 years (22.04), 3 to 5 years (32.44), and >5 years (40.44), but had no significant differences in post-tests score increasing. Pre-test scores of participants who worked in the MCH section were significantly higher (36.53±9.18) than those who worked in the non-MCH division (32.33±9.65) (p <0.05); however, the rise in post-test scores did not differ significantly between the two groups ($p = 0.875$). There was a significant increase (p <0.001) on the test before and after the intervention, with an average increase of 42.18 points and was not influenced by any other variables.

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DOI: 10.33678/cor.2023.001

Please cite this article as: Ardiana M, Andrianto, Asmarani DN, et al. Knowledge Upgrading of General Practitioners in the Community Health Cares in Surabaya after Joining Virtual Training of Early Cardiovascular Detection in Pregnancy: A Quasi-Experimental Study. Cor Vasa 2023;65:610–616.

Introduction

Maternal and infant health is one of the Millennium Development Goals (MDGs) of the World Health Organization (WHO), which is also a predictor of societal health level. The presence of skilled healthcare professionals is a factor that influences the drop in maternal and newborn mortality.[1] Despite the fact that WHO estimates that 84% of births in 2015–2021 would be managed by qualified health workers, the rate of maternal death in Indonesia remains alarmingly high. According to the 2012 Indonesian Demographic and Health Survey, the number of dead mothers in Indonesia remains high, at 359 per 100,000 live births, whereas the 2015 WHO MDGs global target is 102 per 100,000 live births.[2] In 2021, there were 7,389 maternal deaths, of which 1,077 were attributable to hypertension in pregnancy. Heart disease was the fifth leading cause of maternal death, accounting for 335 deaths.[3]

Late intervention, ineffective services, and misdiagnoses are the most significant contributors to the increase in the number of mothers who have died. The Indonesian health ministry recommends frequencies for antenatal check-ups by qualified health workers to protect the mother and fetus during pregnancy, which are once in the first trimester, twice in the second trimester, and three times in the third trimester. Antenatal evaluation consisting of early risk factor detection, prevention, and treatment of early pregnancy problems.[3]

Providing preventive, curative, and rehabilitative treatments, the Indonesian community health centers anticipated becoming the starting point for screening health and risk factors for pregnancy that should cover a larger portion of society, it is more accessible to the general population.[4] As a result, high-risk pregnancies, including cardiovascular illness, will be recognized and managed more rapidly by competent health providers at community health centers including the general practitioner doctors.

Therefore, Cardiology and vascular medicine department of Airlangga University, in collaboration with Indonesian General Practitioners Association (PDUI) and the Association of Indonesian Doctors (IDI) held a training on Early Detection and Treatment of Heart Disease in Pregnancy based on the Algorithm for the Prevention of Cardiovascular Disease by California Maternal Quality Care Collaborative (CMQCC). Socialization of this practical algorithm hopefully helps facilitate early screening and evaluation of cardiovascular disease in pregnant or postpartum mothers.

Methodology

This study is a quasi-experimental study with one-group pretest-posttest design. This study was conducted on one group using total sampling. In this study, our team organized virtual training sessions for general practitioners in all Surabaya Community Health Centers on August 6 and 13, 2022. The training included curriculums on cardiovascular illness in pregnancy, as well as screening and referral pathway to more advanced health facilities. The CMQCC screening algorithm for cardiovascular disease in pregnancy was presented as a tool for cardiovascular disease (CVD) early risk stratification and management in pregnancy (Figs 1 and 2). We adopted the CMQCC cardiovascular disease screening algorithm as a screening tool because it has been validated, covers all cardiovascular emergencies in pregnancy, and is simple to implement even at the most basic level of health care facility.[5,6] This study aims to assess the significance of knowledge increasing in general practitioners of Surabaya community he-

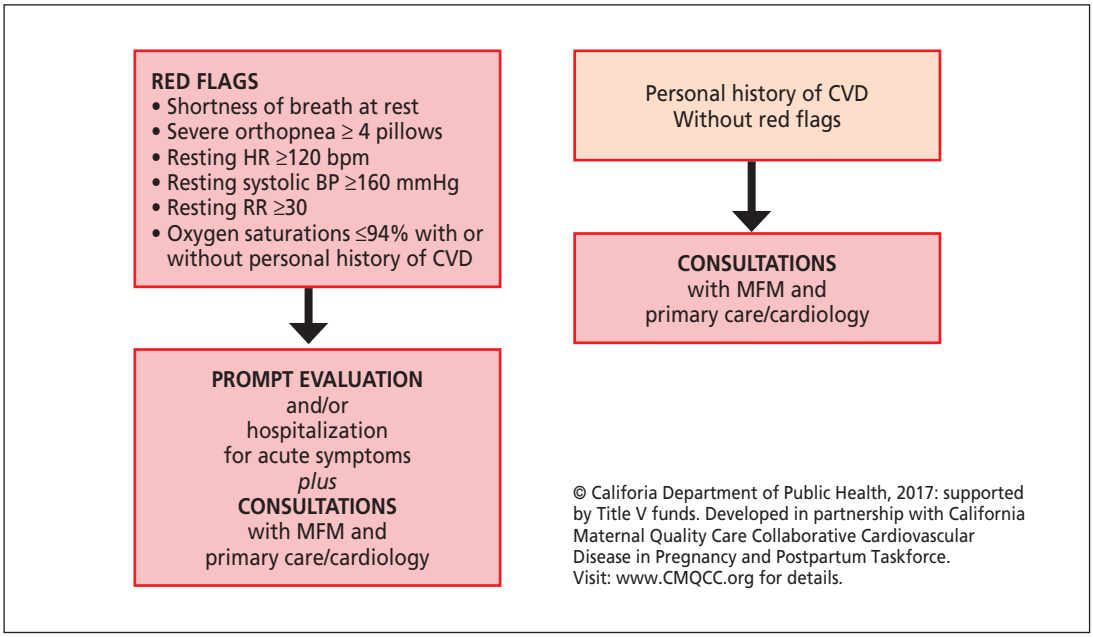

Fig. 1 – Screening algorithm of cardiovascular disease for pregnant and postpartum women – "red flags" from CMQCC.

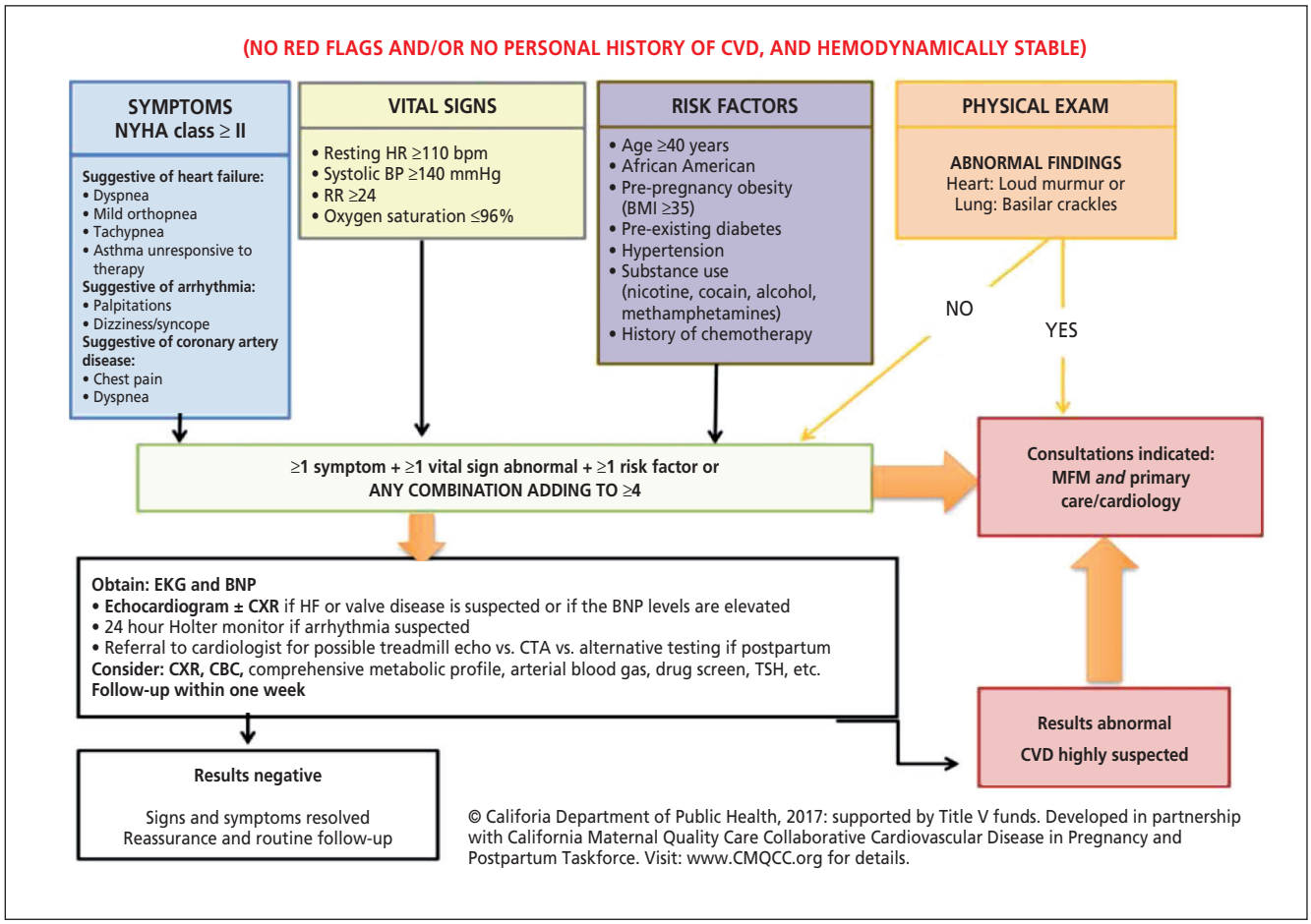

Fig. 2 – Screening algorithm of cardiovascular disease in pregnant and postpartum women from CMQCC.

alth centers about screening, recognizing, and managing cardiovascular disease in pregnancy after receiving the training virtually.

Pre-test and post-test questionnaires were shared via a Google form link at the beginning and end of the training to assess the participants' level of knowledge. All training participants who had satisfactorily completed the pre- and post-test questions from the training event met the inclusion criteria. Participants that didn't complete one of the tests were excluded from the study. The questions that have been given and answered by the participants online are not influenced by the author. Data from participants who have answered the questions are kept confidential to avoid data bias.

Statement of ethics

In order to conduct the study, approval was obtained on August 1st, 2022 with an approval from Head of Cardiology and vascular medicine department of Airlangga University (Ref. number 532/UN3/2022) under the name of Meity Ardiana as principal investigator. All participants provided virtual informed consent prior to participating in the study, without identifiable data. The consent form documented the aims, nature, and procedure of the study. Anonymity and confidentiality were strictly maintained.

Sample collection

Study sample was collected using purposive sampling. Participants are representatives of general practitioners who work in community health centers in Surabaya who joined the training held by the researcher team (N = 184). Participants who answered all pre- and post-test questions satisfactorily and provided complete identities were included in the study. Participants who didn't complete one of the pre- and post-tests were excluded from this research. Both the pre-test and post-test consisted of 15 questions and took 20 minutes to complete. The 15 questions were taken from the six training modules presented.

Statistical analysis

Demographic variables and a data sample were presented with descriptive statistics. We presented category variable as frequency and percentage, and continuous variables as mean value (standard deviation) or median (upper-lower). Pre- and post-test result data was displayed with descriptive statistics as mean value (standard deviation). To analyze the significance of the difference between pre- and post-test results, the independent sample T-test was utilized (all of the data was normal distribution data). Pearson correlation test was used to analyze the factors that influence pre- and post-test results, whereas the ANOVA statistical test was used to compare variables

with more than two analyzed using (IBM Corp.) SPSS version 25.0.

Results

Demographic distribution

Participants were general practitioners from 63 Puskesmas in Surabaya (N = 184). Demographic information of participants is shown in Table 1. Participants were categorized according to their gender, age, duration of service at the Puskesmas, and affiliation with the Maternal and Child Health (MCH) division. There were 62 male participants and 122 female participants based on their gender. The mean age of the participants was 31.9 years, with the oldest participant being 24 years old and the oldest participant being 40 years old (Fig. 3).

On average, members have 3.63 years of experience working at the community health centers. The majority (81) of participants had more than five years of experience working at the community health centers, while 53 people had between three and five years of experience and 50 participants had less than three years of experience. There were 68 participants who worked in the field of maternity and child health (MCH) installations at the community health centers, while the remaining 116 participants were not assigned in MCH installations.

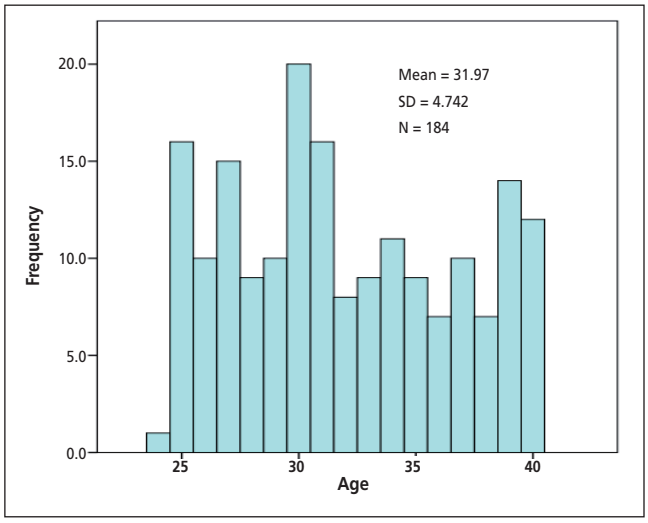

Fig. 3 – Age distribution of study participants. The majority of participants are aged 30 (20 participants).

Table 1 – Characteristic data of participants

Variable	Number of participants (n = 184)
Age (mean)	31.97 years
Sex (n, %)	
Male	62 (33.63%)
Female	122 (66.37%)
MCH affiliated (n, %)	
Yes	68 (36.95%)
No	116 (63.04%)
Working experience (mean)	3,63 years
>5 years (n, %)	81 (44%)
3–5 years (n, %)	53 (28.4%)
<3 years (n, %)	50 (27.17%)

Effects of demographic characteristics on pre-test and post-test scores

Prior to the training, all participants were required to complete a pre-test to assess their knowledge of early identification and management of cardiac disease in pregnancy. Based on the findings of the pretest, the participants'average score was 33.20 (from a maximum value of 43). Then we investigated the outcomes of the pre-test and their relationship to the participants' characteristics to determine what factors impact the baseline knowledge of doctors at the Surabaya Community Health Center on early identification of heart disease in pregnancy, as well as the relation to the results of the post-test (Table 2).

According to the Table 2, the long duration of working experience at the Community Health Centers has a significant effect on the pre- and post-test scores of the participants (p <0.001), as well as the experience of placement

Table 2 – Effects of demographic characteristics on pre-test and post-test scores

	Pearson Correlation Test			
	Pre-test score Mean 33.20		*Post-test score* Mean 75.17	
Variable	Value R	Value *p*	Value R	Value *p*
Sex	0.047	0.527	0.051	0.494
Age	–0.051	0.494	–0.022	0.769
MCH affiliated	0.176	0.017*	0.123	0.097
Working experience	0.791	<0.001*	0.704	<0.001*

* Significance value p <0.05

Table 3 – Comparison of pre-test and post-test scores between participants who work in the MCH and non-MCH division

	MCH	Non-MCH	Mean difference	*p*-value
Pre-test (mean)	36.53±9.18	32.33±9.65	4.19	0.017
Post-test (mean)	77.87±9.45	74.47±11.61	3.40	0.097

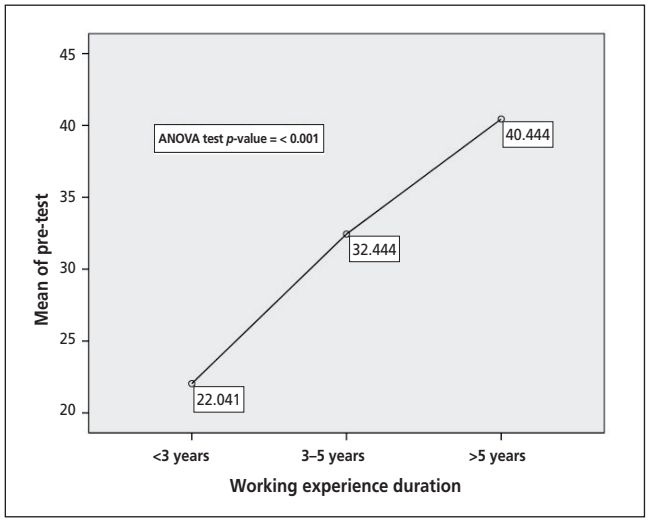

Fig. 4 – The difference in average pre-test scores based on working experience duration.

in MCH has a significant effect on the pre-test scores with poor correlation values (p <0.05). Table 3 provides a comparison of the average pre- and post-test scores of general practitioners in the MCH and non-MCH sections.

The sub-analysis indicated that there was a statistically significant difference (ANOVA p value < 0.001) in the pretest scores between groups with work experience of 3 years (22.04), 3 to 5 years (32.44), and >5 years (40.44) (Fig. 4). The knowledge baseline from the pre-test score is directly associated to the level of experience or duration of working experience at Community Health Centers.

We also analyzed pre-test results of general practitioners practicing in MCH and non-MCH polyclinics, to assess the basic knowledge of general practitioners who are regularly exposed to pregnant patients. The pre-test scores of participants who worked in the MCH section were significantly higher (36.53±9.18) than those who worked in the non-MCH division (32.33±9.65) (p <0.05) (Table 3); however, the rise in post-test scores did not differ significantly between the two groups (p = 0.875).

Increasing knowledge of participants

Figure 5 illustrates the participants' increased knowledge following the training intervention. The outcomes before and after intervention (pre- and post-test scores) were reported as continuous variables. The pre- and post-test results are then displayed as medians and were compared. The mean score of pre-test was 32.9, whereas the mean score of the post-test was 75. According to the analysis using paired T-test statistic, there was a significant increase (p <0.001) on the test before and after the intervention, with an average increase of 42.18 points (Fig. 5).

Those significant increase of test score results were not affected by age, gender, duration of work experience, or practice experience in MCH (Table 4) (p >0.05). This indicates that the training intervention has improved knowledge of general practitioners of Surabaya Community Health Centers significantly without being interfered

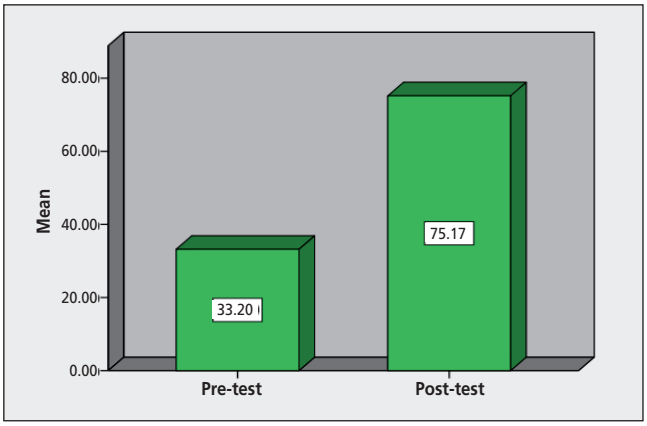

Fig. 5 – The impact of early detection and management of heart disease in pregnancy on increasing the average knowledge of general practitioners at the Community Health Centers.

Table 4 – Influence of demographic factors and confounding variables on increasing of pre- and post-tests score

	Variable	Training intervention			p-value*	p-value**
	p-value**					
		Pre-test scores	Post-test scores	Mean difference pre-post score		
Total participants		33.20±9.79	75.17±9.84	42.69±9.53	<0.001	
Type sex	Woman	32.53±9.73	74.76±11.44	42.31±8.09	<0.001	0.766
	Man	34.50±9.52	75.97±10.95	41.93±8.03	<0.001	
Age	>30 years	32.83±9.31	74.78±11.43	42.31±10.54	<0.001	0.843
	<30 years old	33.98±10.43	75.95±11.32	42.46±11.16	<0.001	
Working time	>5 years	40.44 ± 6.42	82.86±7.54	42.53±7.59	<0.001	0.607
	<5 years	27.5±7.8	69.12 ± 9.94	41.9±8.45	<0.001	
Placement	MCH	36.53±9.18	77.87±9.45	42.36±8.80	<0.001	0.875
	Non MCH	32.33±9.65	74.47±11.61	42.13±7.90	<0.001	

MCH – mother and child healthcare.
* p-value denotes the improvement between the pre- and post-test values for each variable (paired T-test). ** p-value denotes the difference of increased score mean between the variable group (independent T-test). The pre- and post-test results differences were influenced by the training and were not influenced by any other variables.

by confounding variables. This suggests that this training will have a significant impact on improving management of heart disease in pregnant mothers in Surabaya.

Discussion

The increase in maternal mortality is primarily due to cardiovascular illness, both before and during pregnancy. There were 335 maternal deaths from heart disease in pregnancy and 1,077 incidents of hypertension in pregnancy that resulted in maternal mortality in 2021.[3] High rates of congenital heart disease in children who live to adulthood and become pregnant, as well as increased risk factors for cardiovascular disease at a young age and in women of childbearing age, such as atherosclerosis, obesity, hypertension, and diabetes, are risk factors that contribute to high rates of heart disease in pregnancy.[7]

Pregnancy is a complex process involving numerous physiological alterations to the body. These alterations are a result of the body's adaption process in order to meet the requirements of maternal and fetal circulation and preserve pregnancy. Changes in these mechanisms include blood pressure falling due to the decrease in vascular resistance, cardiac rate and output increase, neurohormonal changes, such as hormone progesterone, and relaxing hormone increased activity, also activity enhancement of the renin-angiotensin-aldosterone system.[8] Both symptomatic and asymptomatic cardiovascular disease might be exacerbated during pregnancy. This occurred as a result of the mother's body failing to adapt.[7,8] In a study conducted in Turkey, it was found that there were 47 (5.2%) new cases of cardiovascular disease among a sample of 900 first-trimester pregnant women who had their health checked. There were no prior symptoms or risk factors. This highlights the need of being aware of the signs and symptoms of cardiovascular disease in pregnant women, because pregnancy can result in heart disease complaints even it has not been discovered previously.[10] Because symptoms can resemble or overlap with those of a typical pregnancy's physiological changes, diagnosing cardiovascular disease in pregnancy can be challenging.[11] Thus, pre-conception, peri-partum, and post-partum counseling with a cardiologist, obstetrician specialist, or other competent healthcare staffs is required to prevent maternal death due to heart disease, particularly for women of childbearing age with a history of preeclampsia and heart disease. Healthcare workers, including those in primary care centers, must be knowledgeable about cardiovascular disease in pregnant women.[12]

This study was designed to assess the effectiveness of the training on early detection and management of heart disease in pregnancy provided by Cardiology and vascular medicine department of Airlangga University in collaboration with the Indonesian General Physicians Association (PDUI) and the Indonesian Doctors Association (IDI). The anticipated outcome of the training is an increase in participant knowledge. Participants in the training are general practitioners from Surabaya's Community Health Centers, which are community-accessible health facilities of the most fundamental level.

This training's primary objective is to teach participants about the physiological changes that occur during pregnancy, as well as the various types of heart disease in pregnancy and their treatment, so that they are able to appropriately screen, diagnose, and refer patients to higher level health facilities if necessary.

To avoid misdiagnosis and treatment delays, a standardized and systematic screening pathway is required.[5] In light of this, we employ a screening and diagnostic system based on the algorithm for the detection of cardiovascular disease in pregnancy issued by the California Maternal Quality Care Collaborative (CMQCC).[6]

The California Maternal Quality Care Collaborative (CMQCC), a multi-stakeholder organization dedicated to the prevention of maternal morbidity and mortality in California, has issued an algorithm or pathway that has been validated by a retrospective cohort study of deceased pregnant patients with cardiovascular disease. This algorithm is reportedly capable of assisting health professionals in identifying 88% of cardiovascular disease events during pregnancy.[5]

Prior to the start of the training session, participants were given pre-test questions. The average value from the pre-test was 32.9. The average score on the pre-test was thought to be quite poor because participants were unable to correctly answer half of the questions. This means that the participants' pre-training knowledge of cardiac disease in pregnancy was deemed to be inadequate. Nonetheless, the participants' pre-test results are closely proportionate to their duration of employment in Community Health Centers. Individuals with >5 years of work experience had the highest average pre-test score (40.44), with a significant difference from participants with 3 years and 3–5 years of work experience (ANOVA p <0.001). A significant difference in pre-test scores (p <0.05) was also seen between individuals who worked in the MCH and non-MCH departments, with participants in the MCH division having higher pre-test scores than those in the non-MCH division. This demonstrates that knowledge can increase with work experience and increased patient interaction, particularly with pregnant patients.[13]

In addition to pre-test questions, participants were also given post-test questions with the same substance. Mean post-test score was 75, which meant a significant increase compared with the pre-test score (p-value <0.001). The increase in post-test scores showed that training curriculum has improved the understanding of general practitioners of Community Health Centers in Surabaya regarding screening for heart disease in pregnant women.[14] Other characteristics, such as gender, age of participants, length of work experience, and experience practicing at MCH division had no effect on boosting post-test scores. This suggests that participants have an equal level of understanding of the training material. This can be affected by the homogenous educational background and profession of the participants, who are general practitioners employed by Community Health Centers.

A substantial gain in knowledge suggests that this type of virtual training is extremely beneficial, particularly in the era of the COVID-19 pandemic to avoid the transmission of the COVID-19 virus. A meta-analysis comparing virtual and face-to-face learning methods, concludes that online learning is more successful than face-to-face learning when assisted by knowledgeable moderators

and presenters. In addition, the utilization of other media other than text or writing, such as graphics, video, or audio, and interactive learning methods all contribute to the efficacy of virtual or online learning.[15]

Educational training on preventive and curative care at the community level, particularly for health workers at periphery, can help reduce maternal mortality. The healthy behavior of the population and the knowledge of skilled health professionals have a significant influence in the prevention of numerous diseases.[16] It is expected that health care professionals who have been trained in the early detection and prevention of cardiovascular disease in pregnancy would be able to implement this information in their daily job.

Conclusion

The maternal mortality rate due to heart disease in Indonesia remains high from year to year. Inability to diagnose heart disease during pregnancy and delay in intervention contribute to the mortality of pregnant women with heart disease. It is necessary to standardize an easy-to-understand and simple-to-apply flow of diagnosis and treatment so that pregnant women with heart disease can be diagnosed at an early level health facility.

The training we have provided has educated and expanded the knowledge of general practitioners at Community Health Centers regarding the diagnosis and management of heart disease in pregnant women, so that heart disease in pregnant mothers can be diagnosed and treated early, even before pregnancy. It is anticipated that early diagnosis and treatment of heart disease during pregnancy will reduce maternal and infant mortality.

Conflict of interests

The authors declare there is no conflict of interest.

Authors' contribution

MA and AND designed the study; MA, AND and DNA accumulated the data; MA, AND, DNA and REI drafted the manuscript.

Funding

None to declare.

References

1. SDGs 2019. The sustainable development goals report 2019 United Nations Publ. issued by Dep. Econ. Soc. Aff. 64.
2. Kemenkes RI. 2014 infodatin-ibu.pdf (Jakarta).
3. Kemenkes RI. 2016 Profil Kesehatan Indonesia.
4. Adashi E, Oey-Gardner M, Adriaansz G, et al. 2013 Reducing Maternal and Neonatal Mortality in Indonesia: Saving Lives, Saving the Future Affairs ; National Research Council ; Indonesian Academy of Sciences Joint Committee on Reducing Maternal and Neonatal Mortality in Indonesia Development, Security, (Wahington D.C.: Joint Committee on Reducing Maternal and Neonatal Mortality in Indonesia).
5. Blumenthal EA, Crosland BA, Senderoff D, et al. California Cardiovascular Screening Tool: Findings from Initial Implementation. AJP Rep 2020;10:E362–E368.
6. Hameed AB, Morton CH, Moore A. 2017 Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum Calif. Matern. Qual. Care Collab.
7. Shapero KS, Desai NR, Elder RW, et al. Cardio-obstetrics: Recognizing and managing cardiovascular complications of pregnancy Cleve. Clin J Med 2020;87:43–52.
8. Sanghavi M, Rutherford JD. Cardiovascular physiology of pregnancy Circulation 2014;130:1003–1008.
9. Bozkaya VÖ, Kaplan ZAO, Ozgu EÖ, Engin-Üstün Y. Screening and evaluation of newly diagnosed cardiovascular diseases in first-trimester asymptomatic pregnant women in a tertiary antenatal care center in Turkey. J Cardiol 2020;23:99–104.
10. Hollier Jr JNM, Connolly H, Turrentine M, et al. Clinical management guidelines for obstetrician – gynecologists pregnancy and heart disease. Pract Bull. Pregnancy Heart Dis 2019;133:320–356.
11. Mehta LS, Warnes CA, Bradley E, et al. Cardiovascular Considerations in Caring for Pregnant Patients: A Scientific Statement from the American Heart Association. Circulation 2020;141:e884–e903.
12. Phuspa SM, Rudyarti E. The Relationship of Belief, Experience, Knowledge, and Attitudes Toward Safety Behavior of Construction Workers at University X Ponorogo Indones. J Heal Sci 2017;1:34.
13. Solnes Miltenburg A, van Pelt S, de Bruin W, Shields-Zeeman L. Mobilizing community action to improve maternal health in a rural district in Tanzania: lessons learned from two years of community group activities. Glob Health Action 2019;12.
14. Means B, Toyama Y, Murphy R, et al. Evaluation of Evidence-Based Practices in Online Learning Structure 2009;66.
15. Brandt E, Schmidt W, Dziewas R, Groene O. Implementing the Health Promoting Hospitals Strategy through a combined application of the EFQM Excellence Model and the Balanced Scorecard Heal. Promot Hosp Evid Qual Manag 2005:80–101.